PEER REVIEW REPORT: DRAFT NEP WHITE SHARK STATUS REVIEW (DR. BARRY BRUCE COMMENTS)

This final Peer Review Report summarizes the comments submitted by Dr. Barry Bruce on the draft NEP white shark status review prepared by the NMFS' Biological Review Team pursuant to two petitions to list the population as threatened or endangered under the Endangered Species Act (ESA). The draft status review report was sent to Dr. Bruce on May 17, 2013. Dr. Bruce is affiliated with the CSIRO Division of Marine and Atmospheric Research in Australia.

A summary of Dr. Bruce's comments are presented below and organized by sections of the draft status review report. More detailed track change comments on the draft report are available from NMFS' Southwest Region by making a request to Craig Wingert at craig.wingert@noaa.gov or 562-980-4021. The peer review comments were considered by the BRT and incorporated as appropriate in the final NEP white shark status review (Dewar et al., 2013). The final NEP white shark status review report was used by NMFS, together with other information, to make a 12-month finding on two petitions to list the NEP white shark population as threatened or endangered under the ESA. The 12-month finding was published in the Federal Register on July 3, 2013, and concluded that listing of the NEP white shark population was not warranted.

General Comments

1) The reviewer indicated that the status review report was very detailed and thorough and that he concurred with the assessments and stated findings.
2) The reviewer supported the BRT's assessment of the likely population sizes required to deliver the current estimated catch rates and noted that research in Australia has taken a similar approach in the past and that they are continuing to refine the approach.
3) The reviewer supported the BRT's use of the Structured Expert Decision Methodology (SEDM) approach and indicated it is similar to other procedures used for ecological risk assessments.
4) The reviewer noted that a manuscript has recently been prepared a group of scientists (Burgess et al., manuscript submitted for review) that re-evaluates the published population estimates for the white shark population in the NEP and suggested that it would be relevant to the BRT's status review.
5) The reviewer noted that the status review report included analyses/estimates of trend indices which are a key component for interpreting the status of the population.

Executive Summary

1) The reviewer noted that considerable tagging of white sharks has occurred in Australia and New Zealand which is supportive of the DPS determination. He indicated that data from these tagging studies do not show evidence of white shark movements across the Pacific Ocean to the NEP – at least over the timeframe of the programs. He provided several literature citations to the research.

Introduction

No comments.

Background Information on White Sharks

1) The reviewer suggested that the report emphasize/reiterate that the review of white shark life history and biology focused on data from the NEP, but that it also draws on information from other areas where appropriate or where information on the NEP population is lacking.
2) The reviewer provided a literature citation (Bruce and Bradford 2012) that provides information on the species range, habitat use and definitions for different life history stages of white sharks (e.g. YOY, juveniles, subadults and adults). He also provided the life history definitions for consideration by the BRT.
3) The reviewer suggested language changes related to how gestation was characterized.
4) The reviewer noted an additional literature citation that provided white shark age data using vertebral bands.
5) The reviewer noted and provided two additional literature citations concerning the foraging ecology of white sharks.
6) The reviewer noted that Weng et al. (2012) used SPOT tags on juvenile white sharks and that he has also used SPOT tags on juveniles (Bruce and Bradford 2012).
7) The reviewer suggested the report clarify what is considered to be the nursery ground for white sharks in the NEP. He noted that juvenile white sharks range from Point Conception to Sabastian Vizcaino Bay in Mexico, but speculated that there are more discrete nursery areas with this range. He noted that juvenile white sharks range along much of the east coast of Australia, but that there are only two known nursery areas.
8) The reviewer suggested standardizing the terms nursery area, nursery region, and nursery ground as they were using more or less interchangeably in the status review report.
9) The reviewer noted that there are many pitfalls and biases associated with photo-ID data and referenced the Burgess et al. manuscript and Sosa-Nishizaki et al. (2012) paper.
10) The reviewer noted that Pardini et al. (2001) and others have suggested there is male mediated gene flow across distant populations in white sharks and possibly mako sharks.

DPS Determination

1) The reviewer again noted the Pardini et al. (2001) paper with regard to possible male mediated gene flow in other white shark populations.

Assessment of NEP White Shark Population Extinction Risk

1) The reviewer suggested that the status review report should be more consistent in how it characterized inferences about the abundance of white sharks in the NEP based on the observed level of genetic diversity in the population.
2) The reviewer indicated that increases in white shark attacks on marine mammals could be related to a shift in distribution or expansion of distribution rather than a population increase of white sharks.
3) The reviewer commented that even though an increase in white shark numbers may be linked to an increase in encounter rates with humans, the relationship between attacks on

humans and abundance is unknown and thus cannot be used to assess population size.

4) The reviewer stated that use of the term "population" in describing the white sharks visiting aggregation sites is misleading.
5) The reviewer indicated that localized site fidelity of white sharks to coastal sites over sometimes small scales has also been reported in other geographic areas including South Africa, Australia and New Zealand. He provided literature citations for this evidence.
6) The reviewer indicated that white sharks use of unknown or previously unoccupied habitat areas has been reported off the east coast of the U.S.
7) The reviewer noted that Australia and New Zealand now have extensive white shark tagging programs and that in Australia the tagging programs involve all life history stages and utilize acoustic, PSAT and other types of tagging.